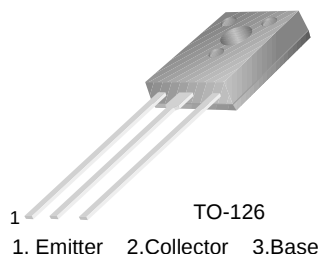


# BD675A/677A/679A/681

## Medium Power Linear and Switching Applications

- Medium Power Darlington TR
- Complement to BD676A, BD678A, BD680A and BD682 respectively

## NPN Epitaxial Silicon Transistor



TO-126  
1. Emitter 2. Collector 3. Base

### Absolute Maximum Ratings $T_C=25^\circ\text{C}$ unless otherwise noted

| Symbol    | Parameter                                        | Value      | Units            |
|-----------|--------------------------------------------------|------------|------------------|
| $V_{CBO}$ | Collector-Base Voltage : BD675A                  | 45         | V                |
|           | : BD677A                                         | 60         | V                |
|           | : BD679A                                         | 80         | V                |
|           | : BD681                                          | 100        | V                |
| $V_{CEO}$ | Collector-Emitter Voltage : BD675A               | 45         | V                |
|           | : BD677A                                         | 60         | V                |
|           | : BD679A                                         | 80         | V                |
|           | : BD681                                          | 100        | V                |
| $V_{EBO}$ | Emitter-Base Voltage                             | 5          | V                |
| $I_C$     | Collector Current (DC)                           | 4          | A                |
| $I_{CP}$  | *Collector Current (Pulse)                       | 6          | A                |
| $I_B$     | Base Current                                     | 100        | mA               |
| $P_C$     | Collector Dissipation ( $T_C=25^\circ\text{C}$ ) | 40         | W                |
| $T_J$     | Junction Temperature                             | 150        | $^\circ\text{C}$ |
| $T_{STG}$ | Storage Temperature                              | - 65 ~ 150 | $^\circ\text{C}$ |

### Electrical Characteristics $T_C=25^\circ\text{C}$ unless otherwise noted

| Symbol         | Parameter                                                                            | Test Condition                                                                                                                                                | Min.                  | Typ. | Max.                     | Units                                                            |
|----------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------|--------------------------|------------------------------------------------------------------|
| $V_{CEO(sus)}$ | *Collector-Emitter Sustaining Voltage<br>: BD675A<br>: BD677A<br>: BD679A<br>: BD681 | $I_C = 50\text{mA}$ , $I_B = 0$                                                                                                                               | 45<br>60<br>80<br>100 |      |                          | V<br>V<br>V<br>V                                                 |
| $I_{CBO}$      | Collector-Base Voltage : BD675A<br>: BD677A<br>: BD679A<br>: BD681                   | $V_{CB} = 45\text{V}$ , $I_E = 0$<br>$V_{CB} = 60\text{V}$ , $I_E = 0$<br>$V_{CB} = 80\text{V}$ , $I_E = 0$<br>$V_{CB} = 100\text{V}$ , $V_{BE} = 0$          |                       |      | 200<br>200<br>200<br>200 | $\mu\text{A}$<br>$\mu\text{A}$<br>$\mu\text{A}$<br>$\mu\text{A}$ |
| $I_{CEO}$      | Collector Cut-off Current : BD675A<br>: BD677A<br>: BD679A<br>: BD681                | $V_{CE} = 45\text{V}$ , $V_{BE} = 0$<br>$V_{CE} = 60\text{V}$ , $V_{BE} = 0$<br>$V_{CE} = 80\text{V}$ , $V_{BE} = 0$<br>$V_{CE} = 100\text{V}$ , $V_{BE} = 0$ |                       |      | 500<br>500<br>500<br>500 | $\mu\text{A}$<br>$\mu\text{A}$<br>$\mu\text{A}$<br>$\mu\text{A}$ |
| $I_{EBO}$      | Emitter Cut-off Current                                                              | $V_{EB} = 5\text{V}$ , $I_C = 0$                                                                                                                              |                       |      | 2                        | mA                                                               |
| $h_{FE}$       | * DC Current Gain : BD675A/677A/679A<br>: BD681                                      | $V_{CE} = 3\text{V}$ , $I_C = 2\text{A}$<br>$V_{CE} = 3\text{V}$ , $I_C = 1.5\text{A}$                                                                        | 750<br>750            |      |                          |                                                                  |
| $V_{CE(sat)}$  | * Collector-Emitter Saturation Voltage<br>: BD675A/677A/679A<br>: BD681              | $I_C = 2\text{A}$ , $I_B = 40\text{mA}$<br>$I_C = 1.5\text{A}$ , $I_B = 30\text{mA}$                                                                          |                       |      | 2.8<br>2.5               | V<br>V                                                           |
| $V_{BE(on)}$   | * Base-Emitter ON Voltage : BD675A/677A/679A<br>: BD681                              | $V_{CE} = 3\text{V}$ , $I_C = 2\text{A}$<br>$V_{CE} = 3\text{V}$ , $I_C = 1.5\text{A}$                                                                        |                       |      | 2.5<br>2.5               | V<br>V                                                           |

\* Pulse Test: PW=300 $\mu\text{s}$ , duty Cycle=1.5% Pulsed

## Typical Characteristics

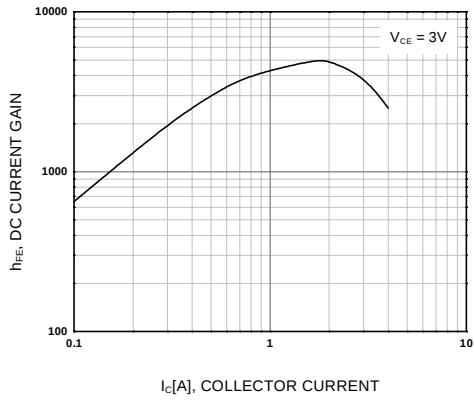


Figure 1. DC current Gain

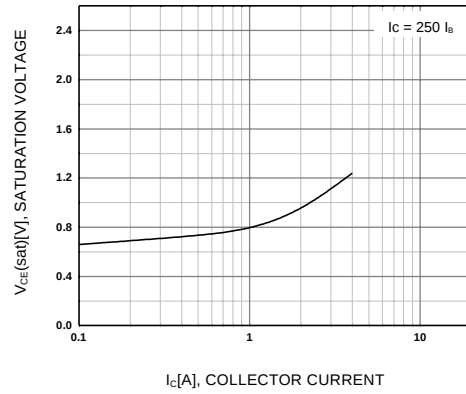


Figure 2. Collector-Emitter Saturation Voltage

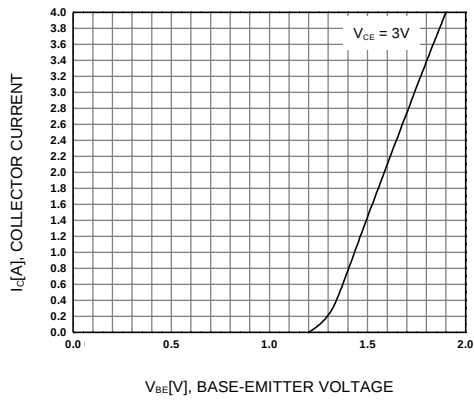


Figure 3. Base-Emitter On Voltage

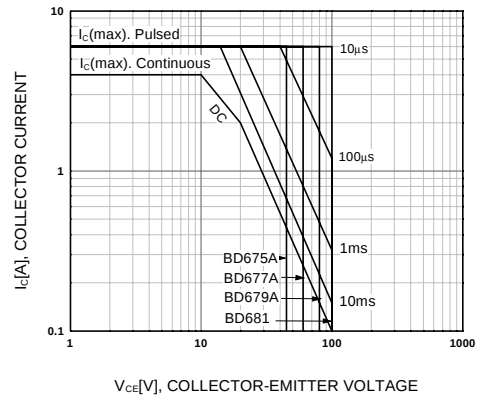


Figure 4. Safe Operating Area

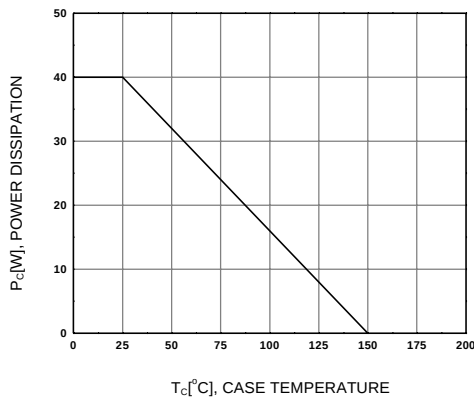


Figure 5. Power Derating

## Package Dimensions

### TO-126



Dimensions in Millimeters

BD675A/677A/679A/681

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